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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/822,368	04/12/2004	Jennifer Elizabeth Dobmcicr	7346	3083
29602	7590	06/20/2007	EXAMINER	
JOHNS MANVILLE			DAY, HERNG DER	
10100 WEST UTE AVENUE			ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/822,368	DOBMEIER ET AL.
	Examiner Herng-der Day	Art Unit 2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 12 April 2004.  
 2a) This action is FINAL.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-21 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-21 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 12 April 2004 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date. \_\_\_\_\_.  
 5) Notice of Informal Patent Application  
 6) Other: \_\_\_\_\_.

**DETAILED ACTION**

1. Claims 1-21 have been examined and rejected.

*Specification*

2. The disclosure is objected to because of the following informality. Appropriate correction is required.
  - 2-1. It appears that “may is analyzed”, as described in line 4 of page 8, should be “may be analyzed”.
  3. Please use the metric (S.I.) units followed by the equivalent English units when describing the inventions in the specifications of patent applications. See MPEP 608.01(IV).

*Claim Rejections - 35 USC § 112*

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
5. Claims 1-21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
  - 5-1. Claim 1 recites the limitation “the selected physical properties” at lines 5-6 of the claim. There is insufficient antecedent basis for this limitation in the claim. Furthermore, claim 1 recites the limitation “selecting components for the mat” at line 12 of the claim. However, in the

“selecting various physical characteristics” step, the components to be included in the mat were already known.

**5-2.** Claim 11 recites the limitation “a mat production design comprising one or more production values” at line 7 of the claim. It is unclear what the “one or more production values” are referred to. For the purpose of claim examination, the Examiner will presume the “one or more production values” refer to the “one or more production component values”.

**5-3.** Claim 21 recites the limitation “the selected physical properties” at lines 7-8 of the claim. There is insufficient antecedent basis for this limitation in the claim. Furthermore, claim 21 recites the limitation “selecting components for the mat” at line 15 of the claim. However, in the “selecting physical characteristics” step, the components to be included in the mat were already known.

**5-4.** Claims not specifically rejected above are rejected as being dependent on a rejected claim.

### *Recommendations*

6. Claim 1 recites the limitations “the empirical data” in line 8 of the claim. For clarification purposes, the Examiner suggests that “the empirical data” be replaced with “the empirical performance data”.

7. Claims 13-15 recite the limitations “the one or more production components” in lines 1-2 of each claim. For clarification purposes, the Examiner suggests that “the one or more production components” be replaced with “the one or more production component values”.

***Claim Rejections - 35 USC § 102***

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1, 2, and 5 are rejected under 35 U.S.C. 102(b) as being anticipated by Thomas et al., U.S. Patent Application Publication No. 2003/0022583 A1 published January 30, 2003.

9-1. Regarding claim 1, Thomas et al. disclose a method for designing a fibrous non-woven mat production, the method comprising:

selecting various physical characteristics for at least some of the components to be included in the mat (as a function of varying fiber length, paragraph [0093]);

obtaining empirical performance data relating to the mat based on the selected physical properties (Evaluation of the effects, paragraph [0090]; Two high performance fibers were evaluated. Kevlar 29, ... with lengths of 3 and 4 inches, paragraph [0082]);

developing a prediction equation for a performance characteristic of the mat based on the empirical data and the physical characteristics (Develop regression equations, paragraph [0093]);

calculating performance characteristics using the prediction equation, wherein ranges of at least some of the physical characteristics are used in the prediction equation (to predict ballistic resistance as a function of varying fiber length, ..., paragraph [0093]); and

selecting components for the mat based on the calculated performance characteristics (The high modulus fiber blend is advantageous in that the fiber only deformed the 3/4 inches

prior to stopping the projectile in comparison to the 23/4 inch penetration of the Kevlar, paragraph [0136]).

**9-2.** Regarding claim 2, Thomas et al. further disclose wherein the empirical performance data is selected from a group consisting of tear strength, tensile strength and dispersion (Strain wave velocity is the speed at which a fiber or structure can absorb and disperse strain energy, paragraph [0061]).

**9-3.** Regarding claim 5, Thomas et al. further disclose wherein the prediction equation is developed using a regression analysis (Develop regression equations, paragraph [0093]).

***Claim Rejections - 35 USC § 103***

**10.** The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**11.** Claims 3-4, 6-10, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al., U.S. Patent Application Publication No. 2003/0022583 A1 published January 30, 2003, in view of Kajander, U.S. Patent 5,837,620 issued November 17, 1998.

**11-1.** Regarding claims 3-4 and 6-10, Thomas et al. disclose a method for designing a fibrous non-woven mat production in claim 1.

Thomas et al. fail to expressly disclose wherein the components comprise glass fiber and binder content and details of glass fiber and binder content. Nevertheless, Thomas et al. suggest

the referred fibers can be substituted by any fibers having the desired properties for ballistic resistant purpose.

Kajander discloses a fiber glass mat and suggests at the first paragraph of the detailed description of the invention, "Mats of the present invention contain about 25-75 weight percent fibers and about 15-75 percent binder. The majority of the fibers are glass fibers. The glass fibers which can be used to make mats can have various fiber diameters and lengths dependent on the strength and other properties desired in the mat as is well known. It is preferred that the majority of the glass fibers have diameters in the range of less than 1 up to 23 microns or higher, with the major portion of the fiber being preferably in the range of about 6 to 19 microns and most preferably in the range of about 8 to 16 microns. ... Normally the glass fibers used all have about the same target length, such as 0.25, 0.5, 0.75, 1 or 1.25 inch, but fibers of different lengths and different average diameters can also be used to get different characteristics in a known manner. ... Generally the longer the fiber, the higher the tensile and tear strengths of the mat, but the poorer the fiber dispersion."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Thomas et al. to incorporate the teachings of Kajander to obtain the invention as specified in claims 3-4 and 6-10 because, as suggested by Kajander, the glass fibers which can be used to make mats can have various fiber diameters and lengths dependent on the strength and other properties desired in the mat as is well known. In other words, for the desired strength and other properties one of ordinary skill would like to use various fiber diameters and lengths.

**11-2.** Regarding claim 21, Thomas et al. disclose a method for designing a fibrous non-woven mat production, the method comprising:

selecting physical characteristics for at least some components to be included in the mat (as a function of varying fiber length, paragraph [0093]), [wherein the components include glass fibers and binder, and wherein the physical characteristics include length and diameters of the glass fiber and content, by percentage weight, of the binder];

obtaining empirical performance data relating to the mat based on the selected physical properties (Evaluation of the effects, paragraph [0090]; Two high performance fibers were evaluated. Kevlar 29, ... with lengths of 3 and 4 inches, paragraph [0082]), wherein the empirical performance data is selected from the group consisting of tear strength, tensile strength and dispersion (Strain wave velocity is the speed at which a fiber or structure can absorb and disperse strain energy, paragraph [0061]);

developing a prediction equation for a performance characteristic of the mat based on the empirical data and the physical characteristics (Develop regression equations, paragraph [0093]);

calculating performance characteristics using the prediction equation, wherein ranges of at least some of the physical characteristics are used in the prediction equation (to predict ballistic resistance as a function of varying fiber length, ..., paragraph [0093]); and

selecting components for the mat based on the calculated performance characteristics (The high modulus fiber blend is advantageous in that the fiber only deformed the 3/4 inches prior to stopping the projectile in comparison to the 23/4 inch penetration of the Kevlar, paragraph [0136]).

Thomas et al. fail to expressly disclose wherein the components include glass fibers and binder, and wherein the physical characteristics include length and diameters of the glass fiber and content, by percentage weight, of the binder. Nevertheless, Thomas et al. suggest the referred fibers can be substituted by any fibers having the desired properties for ballistic resistant purpose.

Kajander discloses a fiber glass mat and suggests at the first paragraph of the detailed description of the invention, "Mats of the present invention contain about 25-75 weight percent fibers and about 15-75 percent binder. The majority of the fibers are glass fibers. The glass fibers which can be used to make mats can have various fiber diameters and lengths dependent on the strength and other properties desired in the mat as is well known. It is preferred that the majority of the glass fibers have diameters in the range of less than 1 up to 23 microns or higher, with the major portion of the fiber being preferably in the range of about 6 to 19 microns and most preferably in the range of about 8 to 16 microns. ... Normally the glass fibers used all have about the same target length, such as 0.25, 0.5, 0.75, 1 or 1.25 inch, but fibers of different lengths and different average diameters can also be used to get different characteristics in a known manner. ... Generally the longer the fiber, the higher the tensile and tear strengths of the mat, but the poorer the fiber dispersion."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Thomas et al. to incorporate the teachings of Kajander to obtain the invention as specified in claim 21 because, as suggested by Kajander, the glass fibers which can be used to make mats can have various fiber diameters and lengths dependent on the

strength and other properties desired in the mat as is well known. In other words, for the desired strength and other properties one of ordinary skill would use various fiber diameters and lengths.

**12.** Claims 11-13, 19, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al., U.S. Patent Application Publication No. 2003/0022583 A1 published January 30, 2003.

**12-1.** Regarding claims 11 and 20, Thomas et al. disclose a system for designing a fibrous non-woven mat production, the system comprising:

[a processor] to develop a prediction equation to calculate one or more production component values based on a performance characteristic value (Develop regression equations, paragraph [0093]), wherein the prediction equation is developed from data on a performance characteristic of the mat generated by one or more designed experiments (Evaluation of the effects, paragraph [0090]; Two high performance fibers were evaluated. Kevlar 29, ... with lengths of 3 and 4 inches, paragraph [0082]); and

a mat production design comprising one or more production values calculated from a desired performance characteristic value input into the prediction equation (to predict ballistic resistance as a function of varying fiber length, ..., paragraph [0093]).

Thomas et al. fail to expressly disclose using a processor or a computer to develop the prediction equation. Nevertheless, Thomas et al. suggest using regression analysis (paragraphs [0080], [0085], [0093], and [0125]) and statistical design method (paragraph [0097]).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Thomas et al. to use a computer to develop the prediction equation via the suggested regression analysis and statistical design method to obtain the

invention as specified in claims 11 and 20 because using computer for regression analysis is much efficient.

**12-2.** Regarding claim 12, Thomas et al. further disclose wherein the performance characteristic is selected from the group consisting of tear strength, tensile strength and dispersion (Strain wave velocity is the speed at which a fiber or structure can absorb and disperse strain energy, paragraph [0061]).

**12-3.** Regarding claim 13, Thomas et al. further disclose wherein the one or more production components are selected from the group consisting of a materials characteristic and a production characteristic (Two high performance fibers were evaluated. Kevlar 29, ... with lengths of 3 and 4 inches, paragraph [0082]).

**12-4.** Regarding claim 19, Thomas et al. further disclose wherein the prediction equation is developed using a regression analysis (Develop regression equations, paragraph [0093]).

**13.** Claims 14-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomas et al., U.S. Patent Application Publication No. 2003/0022583 A1 published January 30, 2003, in view of Kajander, U.S. Patent 5,837,620 issued November 17, 1998.

**13-1.** Regarding claims 14-18, Thomas et al. disclose a system for designing a fibrous non-woven mat production in claim 11.

Thomas et al. fail to expressly disclose wherein the mat comprise glass fiber and binder content and details of glass fiber and binder content. Nevertheless, Thomas et al. suggest the referred fibers can be substituted by any fibers having the desired properties for ballistic resistant purpose.

Kajander discloses a fiber glass mat and suggests at the first paragraph of the detailed description of the invention, "Mats of the present invention contain about 25-75 weight percent fibers and about 15-75 percent binder. The majority of the fibers are glass fibers. The glass fibers which can be used to make mats can have various fiber diameters and lengths dependent on the strength and other properties desired in the mat as is well known. It is preferred that the majority of the glass fibers have diameters in the range of less than 1 up to 23 microns or higher, with the major portion of the fiber being preferably in the range of about 6 to 19 microns and most preferably in the range of about 8 to 16 microns. ... Normally the glass fibers used all have about the same target length, such as 0.25, 0.5, 0.75, 1 or 1.25 inch, but fibers of different lengths and different average diameters can also be used to get different characteristics in a known manner. ... Generally the longer the fiber, the higher the tensile and tear strengths of the mat, but the poorer the fiber dispersion."

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Thomas et al. to incorporate the teachings of Kajander to obtain the invention as specified in claims 13-18 because, as suggested by Kajander, the glass fibers which can be used to make mats can have various fiber diameters and lengths dependent on the strength and other properties desired in the mat as is well known. In other words, for the desired strength and other properties one of ordinary skill would like to use various fiber diameters and lengths.

***Conclusion***

**14.** The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

Reference to Mallick, "Chapter 6, Design", Fiber-Reinforced Composites, materials, manufacturing, and design, Marcel Dekker, Inc., 1993, pages 437-508, is cited as disclosing design of fiber-reinforced composites.

Reference to Bader, "Selection of Composite Materials and Manufacturing Routes for Cost-Effective Performance", Composites Part A: Applied Science and Manufacturing, Volume 33, Issue 7, July 2002, pages 913-934, is cited as disclosing selection of composite materials.

**15.** Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Herng-der Day whose telephone number is (571) 272-3777. The Examiner can normally be reached on 9:00 - 17:30.

Any inquiry of a general nature or relating to the status of this application should be directed to the TC 2100 Group receptionist: (571) 272-2100.

If attempts to reach the Examiner by telephone are unsuccessful, the Examiner's supervisor, Kamini S. Shah can be reached on (571) 272-2279. The fax phone numbers for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR

system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Herng-der Day *H.D.*  
June 11, 2007

*Kamini Shah*  
KAMINI SHAH  
SUPERVISORY PATENT EXAMINER